

USEFULNESS OF LARVAL OSMETERIA IN DETERMINING NATURAL CLASSIFICATION IN ALEOCHARINAE (COLEOPTERA: STAPHYLINIDAE)¹

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ABSTRACT: The presence or absence of the osmeterium in the larvae of Aleocharinae should be useful in determining natural relations.

The discovery of the osmeterium of the larva of certain members of the subfamily Aleocharinae (Badgley and Flescher 1956) and its further elucidation (Moore et al. 1975) strengthens doubts concerning the validity of the present classification of that large subfamily of rove beetles.

The osmeterium of certain Aleocharinid larvae is borne on the eighth abdominal segment. It is an organ similar to that which is present on the thorax of the larvae of swallow-tailed butterflies. Its presence is indicated by the occurrence of a heavily pigmented chitinized tumescence in the center of the eighth tergite. This tumescence is composed of two plates or opercula which are separated by a transverse slit. When the larva of *Oligota oviformis* is touched with a camel-hair brush, the opercula part and the short bright orange osmeterium is briefly protruded. Badgley and Fleschner speculated that the osmeterium is a protective device which may exude an offensive odor and consequently aid in escape from predation.

The presence or absence of an osmeterium is easily determined in preserved specimens by the occurrence of the swollen pigmented chitinized opercula.

It seems highly unlikely that the osmeterium of the larvae of the Aleocharinae could have developed more than a single time during the evolution of the subfamily. If it evolved only once then all genera with the organ stem from a common ancestor. For example, *Bryothinusa* with its "primitive" adult mouth parts may be closely related to *Diaulota* with "normal" adult trophi.

In the following list (Table 1), according to the classification of Bernhauer and Schubert (1910-1916), three genera whose larvae lack the osmeterium are placed in tribes which also contain genera where the osmeterium is present. This still prevalent classification, dating back to Erichson (1839-40), is based largely on the segmentation of the tarsi and

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mouth parts. It has been a classification of convenience declared of doubtful validity from an evolutionary point of view by Seevers (1965) and others.

It would seem preferable to group together those genera in which the osmeterium is present in the larvae. It is not possible to do this at present because very few larvae of this large subfamily are known. However, some consideration should be given to the presence of this organ in any further reclassification of the group.

Table 1. Some genera of the Aleocharinae whose larvae have or lack an osmeterium and the tribes in which they were placed by Bernhauer and Schubert (1910-1916).

| 1. Genera with osmeterium | Tribe |
|------------------------------|---------------|
| 1. <i>Oligota</i> | Oligotini |
| 2. <i>Alianta</i> | Myrmedoniini |
| 3. <i>Lomecusha</i> | Myrmedoniini |
| 4. <i>Bryothinusa</i> | Bolitocharini |
| 5. <i>Habnaeus</i> | Bolitocharini |
| 6. <i>Bolitochara</i> | Bolitocharini |
| 7. <i>Gyrophaena</i> | Bolitocharini |
| 8. <i>Phytosus</i> | Bolitocharini |
| 9. <i>Tectura</i> | Bolitocharini |
| 10. <i>Diaulota</i> | Bolitocharini |
| 11. <i>Liparocephalus</i> | Bolitocharini |
| 12. <i>Phloeopora</i> | Aleocharini |
| 13. <i>Microglotta</i> | Aleocharini |
| 2. Genera without osmeterium | |
| 14. <i>Cyphea</i> | Bolitocharini |
| 15. <i>Atheta</i> | Myrmedoniini |
| 16. <i>Aleochara</i> | Aleocharini |

LITERATURE CITED

- Badgley, M.E. and C.A. Fleschner. 1956. Biology of *Oligota oviformis* Casey (Coleoptera: Staphylinidae). Ann. Ent. Soc. America 49:501-502.
- Bernhauer, M. and K. Schubert. 1910-1916. Coleopterorum catalogus, Staphylinidae, 798 pp. Berlin: W. Junk.
- Erichson, W.F. 1839-1840. Genera et species staphylinorum insectorum coleopterorum familiae, 954 pp. Berlin: F.H. Morin.
- Moore, Ian, E.F. Legner and M.E. Badgley. 1975. Description of the developmental stages of the mite predator, *Oligota oviformis* Casey, with notes on the osmeterium and its glands (Coleoptera: Staphylinidae). Psyche 82: 181-188, 9 Figs.
- Seevers, C. 1965. The systematics, evolution and zoogeography of staphylinid beetles associated with army ants (Coleoptera: Staphylinidae), Fieldiana: Zoology 47:138-351, 23 Figs.